

ABSTRACT

A flood risk prediction system based on water level has been designed using fuzzy logic to predict flood risks based on changes in water levels. The system utilizes Arduino MKR Wi-Fi 1010 and HC-SR04 ultrasonic sensors as the main devices. Water level data is processed using fuzzy logic to classify flood risks into "safe," "alert," and "danger" categories. Prediction results are displayed on an LCD and stored in Firebase Database in realtime. Testing results show that the ultrasonic sensor has an average error of 2.37%, while the fuzzy logic predictions achieve high accuracy with a 0.01% error rate. This system can provide accurate flood risk information, although data transmission to Firebase depends on stable internet connectivity.

Keywords: *flood, Fuzzy logic, Arduino, risk prediction, ultrasonic sensor.*